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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,897	07/28/2003	Kenneth D. Price	PD-02W116	7429

23915 7590 10/13/2004

PATENT DOCKET ADMINISTRATION
RAYTHEON SYSTEMS COMPANY
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EXAMINER

DOERRLER, WILLIAM CHARLES

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,897

Applicant(s)

PRICE ET AL.

Examiner

William C Doerrler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7-28-2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5,9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al (6,330,800) in view of Hiresaki et al.

Price et al '800 discloses applicants' basic inventive concept, a combined Stirling and pulse tube cooler with the pulse tube inlet receiving gas from the Stirling expander through the first stage regenerator (col 2), substantially as claimed with the exception of a bypass connecting the pulse tube outlet with the first stage regenerator outlet.

Hiresaki et al show this feature to be old in the pulse tube cooling art. Bypass 23 connects the outlet of pulse tube 22 to the outlet of first stage regenerator 11. It would

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have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Hiresaki et al to modify the cryocooler of Price et al '800 by adding a bypass between the outlet of the pulse tube and the outlet of the first stage regenerator to improve the functioning of the pulse tube by improving the frequency matching with the first stage. In regard to claim 9, the percent of flow through the bypass is seen as a matter of design choice to be made by an ordinary practitioner in the art. Hiresaki et al teaches that the bypass is to modulate the frequency of the pulse tube. One of ordinary skill in the art would realize that this means less than half of the flow passes through the bypass and would experiment to find the proper amount. In regard to claim 11, the relative sizes of the constriction 26 and the tube 28 are seen as a passive means to control flow. In regard to claim 12, line 28 of column 7 states that a valve may be used to control the flow through the bypass.

Claims 1,2,6-11,15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al (6,330,800) in view of Gao '998.

Price et al '800 discloses applicants' basic inventive concept, a combined Stirling and pulse tube cooler with the pulse tube inlet receiving gas from the Stirling expander through the first stage regenerator (col 2), substantially as claimed with the exception of a bypass connecting the pulse tube outlet with the first stage regenerator inlet. Gao '998 show this feature to be old in the pulse tube cooling art. An unnumbered bypass in figure 1 which contains constriction 42 connects the outlet of low temperature pulse tube 14 to the outlet of first stage regenerator 16. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Gao '998

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to modify the cryocooler of Price et al '800 by adding a bypass between the outlet of the pulse tube and the inlet of the first stage regenerator to improve the functioning of the pulse tube by improving the frequency matching with the first stage. In regard to claims 9 and 16, the percent of flow through the bypass is seen as a matter of design choice to be made by an ordinary practitioner in the art. Hiresaki et al teaches that the bypass is to modulate the frequency of the pulse tube. One of ordinary skill in the art would realize that this means less than half of the flow passes through the bypass and would experiment to find the proper amount.

Allowable Subject Matter

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

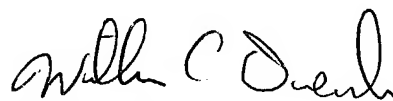
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Habermusch, Hafner et al and Kuriyama et al show multiple stage cryocoolers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C Doerrler whose telephone number is (703) 308-0696. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on (703) 308-2597. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William C Doerrler
Primary Examiner
Art Unit 3744

WCD